In the Claims

This listing of claims will replace all prior versions, and listings, of claims in the application.

1. (Canceled)

2. (Currently Amended) An apparatus to control slurry flow in a chemical mechanical polishing apparatus for planarizing an object to be polished by supplying slurry on a grinding pad through a slurry injection nozzle, the apparatus comprising:

a slurry supply unit to supply slurry to the slurry injection nozzle through a slurry supply line;

a by-pass diverged from the slurry supply line, wherein the slurry flowing in the by-pass is returned to the slurry supply line;

a photo image sensor to detect a cross-sectional image of the slurry flowing in the by-pass, and to detect sizes of particles included in the detected cross-sectional image and a particle density of two dimensions of the slurry across a cross-section of the by-pass, the cross-sectional image being an image of the slurry flowing in the by-pass across the entire cross-section of the by-pass;

a slurry measuring unit to analyze the cross-sectional image captured by the photo image sensor to measure the sizes of particles included in the slurry and the particle density of the slurry across the cross-section of the by-pass;

a diluent solution supply unit to supply diluent solution into the by-pass to reduce a concentration of particles in the slurry; and

a slurry flow control unit to control the slurry supply unit based upon the particle sizes and the slurry density measured by the slurry measuring unit.

3. (Previously Presented) An apparatus as defined in claim 2, wherein the diluent solution is pure water.

4. (Canceled)

5. (Currently Amended) A method to control slurry flow in a chemical mechanical polishing apparatus for planarizing an object to be polished by supplying slurry on a grinding pad through a

slurry injection nozzle, the method comprising:

supplying slurry to the slurry injection nozzle through a slurry supply line;

introducing slurry into a by-pass diverged from the slurry supply line;

supplying a diluent solution into the by-pass to reduce a concentration of particles of the slurry;

capturing with a photo image sensor a cross-sectional image of the by-pass in which the slurry flows and detecting sizes of particles included in the captured cross-sectional image and a particle density of two dimensions of the slurry across a cross-section of the by-pass, the cross-sectional image being an image of the by-pass across the entire cross-section of the by-pass;

analyzing the cross-sectional image captured by the photo image sensor to measure the sizes of particles included in the slurry and the particle density of the slurry across the cross-section of the by-pass;

returning the slurry in the by-pass to the slurry supply line; and

controlling supply of the slurry based upon the measured sizes of particles and density of slurry.

6. (Previously Presented) A method as defined in claim 5, wherein the diluent solution is pure water.

7. (Previously Presented) A method as defined in claim 5, wherein a density of the slurry supplied to the slurry injection nozzle is calculated to be higher than a density of the supplied diluent solution.

8. (Previously Presented) A method as defined in claim 5, wherein an amount of the particles of the slurry supplied to the slurry injection nozzle is calculated to be higher than an amount of particles of the supplied diluent solution.

Claims 9 and 10. (Canceled)